

C L A I M S

1. A diaphragm pump comprising:
 - an electric motor;
 - a motor shaft, driven by said electric motor for rotation about an electric motor shaft axis;
 - an eccentric drive, driven by said electric motor, via said motor shaft, to provide reciprocal driving along a pump driving axis, said eccentric drive including an eccentric drive shaft rotating about an eccentric drive shaft axis, said eccentric drive shaft axis being coaxial with said electric motor shaft axis;
 - a non-rigid coupling interconnecting said motor shaft and said eccentric drive shaft; and
 - a diaphragm pumping assembly having a fluid inlet and a fluid outlet communicating with a pumping chamber, said pumping chamber having a diaphragm arranged to be reciprocally driven about said pump driving axis.
2. A diaphragm pump according to claim 1 and wherein said non-rigid coupling comprises a slidable coupling.
3. A diaphragm pump according to claim 1 or claim 2 and wherein said eccentric drive includes first and second bearings located on first and second opposite sides of said eccentric drive shaft.
4. A diaphragm pump according to any of the preceding claims 1 - 3 and wherein at least one of said fluid inlet and said fluid outlet extends in a direction non-perpendicular to said pump driving axis.
5. A diaphragm pump according to any of the preceding claims 1 - 3 and wherein at least one of said fluid inlet and said fluid outlet extends generally perpendicular to said pump driving axis.

6. A diaphragm pump comprising:

a diaphragm pumping assembly having a fluid inlet and a fluid outlet communicating with a pumping chamber, said pumping chamber having a diaphragm arranged to be reciprocally driven along a pump driving axis, wherein at least one of said fluid inlet and said fluid outlet extends generally parallel to said pump driving axis.

7. A diaphragm pump according to claim 6 and also comprising:

an electric motor providing rotational motion of a motor shaft about an electric motor shaft axis; and

an eccentric drive including an eccentric drive shaft which is driven by said electric motor, via said motor shaft, about an eccentric drive shaft axis which is coaxial with said electric motor shaft axis.

8. A diaphragm pump comprising:

an electric motor;

a motor shaft, driven by said electric motor for rotation about an electric motor shaft axis;

an eccentric drive, driven by said electric motor, via said motor shaft, to provide reciprocal driving along a pump driving axis, said eccentric drive including an eccentric drive shaft rotating about an eccentric drive shaft axis, said eccentric drive shaft axis being coaxial with said electric motor shaft axis, said eccentric drive including first and second bearings located on first and second opposite sides of said eccentric drive shaft; and

a diaphragm pumping assembly having a fluid inlet and a fluid outlet communicating with a pumping chamber, said pumping chamber having a diaphragm arranged to be reciprocally driven about said pump driving axis.

9. A diaphragm pump according to claim 8 and also comprising a non-rigid coupling interconnecting said motor shaft and said eccentric drive shaft.

10. A diaphragm pump according to claim 9 and wherein said non-rigid coupling comprises a slidable coupling.

11. A diaphragm pump according to any of the preceding claims 8 - 10 and wherein at least one of said fluid inlet and said fluid outlet extends in a direction non-perpendicular to said pump driving axis.
12. A diaphragm pump according to any of the preceding claims 8 - 10 and wherein at least one of said fluid inlet and said fluid outlet extends generally perpendicular to said pump driving axis.
13. A diaphragm pump according to any of the preceding claims 1 – 5, 9 and 10 and also comprising a flange fixed to said electric motor and a housing which houses said non-rigid coupling.
14. A diaphragm pump according to claim 13 and wherein said flange comprises at least one bore and said housing comprises at least one socket, said at least one socket having a diameter larger than a diameter of an attachment bolt.
15. A diaphragm pump according to claim 14 and also comprising a tightness retaining mechanism to secure said attachment bolt in said bore.
16. A diaphragm pump comprising:
 - an electric motor;
 - a pumping chamber; and
 - a manifold assembly directly mounted onto said pumping chamber and comprising a manifold assembly inlet and a manifold assembly exhaust communicating with said pumping chamber.
17. A diaphragm pump according to claim 16 and also comprising:
 - a motor shaft, driven by said electric motor for rotation about an electric motor shaft axis; and
 - an eccentric drive including an eccentric drive shaft which is driven by said electric motor, via said motor shaft, about an eccentric drive shaft axis which is

coaxial with said electric motor shaft axis.

18. A diaphragm pump according to claim 16 or claim 17 and also comprising an absorption cell operative to receive fluid flowing through said manifold assembly inlet.

19. A diaphragm pump according to any of the preceding claims 16 - 18 and also comprising a detector operative to detect fluid flowing through said manifold assembly inlet.

20. A diaphragm pump according to claim 17 and also comprising a non-rigid coupling interconnecting said motor shaft and said eccentric drive shaft.

21. A diaphragm pump according to claim 20 and wherein said non-rigid coupling comprises a slidable coupling.

22. A diaphragm pump according to any of the preceding claims 17, 20 and 21 and wherein said eccentric drive includes first and second bearings located on first and second opposite sides of said eccentric drive shaft.

23. A method for aligning an eccentric drive shaft axis of an eccentric drive of a diaphragm pump and an electric motor shaft axis of an electric motor of said diaphragm pump comprising:

providing a non-rigid coupling;

interconnecting an eccentric drive shaft of said eccentric drive and a motor shaft of said electric motor employing said non-rigid coupling;

loosely attaching said electric motor to a housing of said eccentric drive;

operating said electric motor to coaxially align said eccentric drive shaft and said electric motor shaft; and

tightly attaching said electric motor to said housing.

24. A method according to claim 23 and wherein said operating also comprises providing an output indication that said electric motor shaft axis and said eccentric drive shaft axis are coaxially aligned.
25. A method according to claim 24 and wherein said output indication is an output of said diaphragm pump displayed on a monitoring device.
26. A method according to claim 23 and wherein said operating also comprises manually positioning at least one of said electric motor and said housing.